

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

CONDITIONAL MAJOR (DRAFT PERMIT) No. F-05-028
PITTSBURG TANK & TOWER, ELEVATED DIVISION, INC.
SEBREE KY.

SEPTEMBER 7, 2005

BRIAN BALLARD, REVIEWER

SOURCE I.D. #:	21-233-00078
SOURCE A.I. #:	35816
ACTIVITY #:	APE20040001

SOURCE DESCRIPTION:

Pittsburg Tank & Tower, Elevated Division, Inc. (PT&T), is a facility located at 1329 U.S. Highway 41 in Sebree, Kentucky. The Sebree, Kentucky facility occupies a 45,000 square foot fabrication and office facility and an 8,800 square foot paint and blast building on approximately 6 acres of land in Webster County. PT&T's primary business activity at this location is the fabrication of steel elevated water storage tanks. The preparation of steel water storage tank sections, prior to field assembly, involves partial fabrication, surface preparation by steel shot metallic abrasive blasting, followed by primer/paint application(s). These operations occur in separate buildings, and at different times. Steel shot blasting is performed within a blast booth located inside the building.

The blast booth is operated under negative pressure and is equipped with a 14,000 ft³/min Hoffman HDFT 4-24 cartridge pulse jet dust collection system. The system includes twenty-four (24) Torit Ultra-web filters with an actual filter area of 6,000 ft². The dust collection system also includes an abrasive inlet plenum, 14-gauge spiral wrap galvanized ductwork, fan, and motor, and a drum collection hopper.

The painting facility consists of painting room with negative airflow forming an air curtain at the open end of the room. The painting facility is equipped with two (2) Aerovent, 60,000 ft³/min air make up units. The air is filtered for particulates and then exhausted. The sloped exhaust system is equipped with four (4) one (1) inch, Supraloft 100D tackified polyester, diffusion media roll type filters. The filters are three (3) feet wide and eighty feet long. These filters create an evenly diffused air flow pattern throughout the filter. The painting operation utilizes one (1) airless operated spray gun. Prior to application, paint is mixed with a solvent, methyl ethyl ketone (MEK). The paint is applied at a maximum rate of approximately twelve and a half (12.5) gallons per hour.

COMMENTS:

Particulate matter (PM) and particulate matter 10 microns or less (PM₁₀) emissions from the blasting booth are calculated using an emission factor of five tenths (0.5) lb PM/PM₁₀ per tons of abrasive consumed. This emission factor is derived from engineering calculations and is referenced from the air quality permit application submitted 9/19/2003. An efficiency of 99.99 % is assumed for the blasting booth dust collection system for the purpose of calculating PM/PM₁₀ emissions.

Volatile organic hazardous air pollutant (VOHAP), volatile organic compound (VOC) and PM/PM₁₀ emissions from painting are calculated by mass balance. The emission factors for specific constituents are calculated from average emissions estimates based on previous years paint usage and directly from Material Safety Data Sheets in the case of Methylene diphenyl diisocyanate (CAS No. 101-68-8). The coating density is assumed to be 16.192 lb/gallon. An efficiency of 99.9% is assumed for the polyester, diffusion media roll type filter for the purpose of calculating PM/PM₁₀ emissions.

COMMENTS (CONTINUED):

Toxic emissions from the source are modeled using SCREEN3. The source of potentially toxic emissions is the paint booth. The paint booth is modeled as a single point source. Emissions from the paint booth are vented through the Aerovent Sloped Exhaust System. There are two Aerovent systems, each equipped with two fans. The flow rate produced by each fan is 25,900 actual cubic feet per minute (ACFM). The diameter of each fan is 42 inches. The fans are 14 feet above the ground. The stack parameters used for modeling purposes are a height of 14 feet (4.27 meters), a diameter of 14 feet (4.27 meters), a flow rate of 103,600 ACFM and a temperature of 293 degrees Kelvin (68°F). The diameter and flow rate used in the model are determined by summing the individual diameters and flow rates of each fan. The emissions are modeled starting at a distance of 150 yards (137.2 meters) away from the theoretical stack and out to a final distance of 50,000 meters. The maximum concentration determined by the model occurs at 137 meters. The toxics evaluated are ethylbenzene (CAS No. 100-41-4), methyl ethyl ketone (CAS No. 78-93-3), methyl isobutyl ketone (108-10-1), xylene (CAS No. 1330-20-7), and methylene diphenyl diisocyanate (CAS No. 101-68-8). The table presents the maximum potential emission rate of each toxic along with the prioritized chronic dose response value (PRDV) for that particulate toxic. The PRDV's can be found at <http://www.epa.gov/ttn/atw/toxsource/table1.pdf>. These are the health-based standards recommended by the EPA, Office of Air Quality Planning and Standards (OAQPS). The source of the health based standard for each of these toxics is the EPA Integrated Risk Information System (IRIS).

Pollutants	CAS No.	Emissions (lb/hr)	Emissions (g/s)	Health based Standard (ug/m ³)	Source	Modeled Concentration (ug/m ³)
Ethylbenzene	100-41-4	4.00	0.504	1000	IRIS	15.89
Xylene	1330-20-7	21.50	2.709	100	IRIS	85.39
Methyl Ethyl Ketone	78-93-3	11.88	1.496	5000	IRIS	47.16
Methyl Isobutyl ketone	108-10-1	3.50	0.441	3000	IRIS	13.90
Methylene diphenyl diisocyanate	101-68-8	17.63	2.221	0.6	IRIS	70.01

Table 1 – Comparison of SCREEN3 Model Results and Health Based Standards

The results of the modeling show that maximum potential emission rate of methylene diphenyl diisocyanate (MDI) results in an exceedance of the recommended health based standard. MDI is present in the coating Tneme-Zinc, Series: F091-0H20A, Product Class: polymeric diisocyanate, hyro-zinc green. The recommended PRDV for MDI is 0.6 µg/m³. The acceptable “target risk” for noncancer endpoints is a hazard index of 1 or less, where hazard index is defined as:

$$\text{Hazard Index} = \frac{\text{Modeled Concentration of } X}{\text{Concentration of } X \text{ in Table}}$$

The hazard index based on potential to emit for MDI is calculated to be 116.7. The allowable

emission rate of MDI that results in a Hazard Index of 1 is 0.66 tons (1,324 lb) per year.

EMISSION AND OPERATING CAPS DESCRIPTION:

The facility will be subject to emission caps of ninety (90.0) tons per year for VOC, nine (9) tons per year for single HAP and twenty-two and a half (22.5) tons per year for combined HAPS. These emission caps will preclude the applicability of the following regulations: 401 KAR 59:225, New miscellaneous metal parts and product surface coating operations and 40 CFR 63, Subpart Mmmm, National Emission Standards for Miscellaneous Metal Parts and Products Surface Coating Operations. The source will be subject to an emission cap of 0.66 tons (1,324 lb) per year for methylene diphenyl diisocyanate (CAS No. 101-68-8) in order to demonstrate compliance with 401 KAR 63:020, potentially hazardous matter and toxic substances.

PERIODIC MONITORING:

Daily monitoring of the pressure drop of the blast booth dust collection system cartridge filters shall be required. A qualitative visual observation of the opacity of emissions from the paint booth shall be required on a weekly basis. The paint booth filters shall be visually inspected daily for solids build-up on days the paint booth is operating. The source will be required to monitor the twelve-month rolling average emissions of VOC, combined HAP, single HAP and specifically methylene diphenyl diisocyanate (CAS No. 101-68-8).

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.